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January 6, 2006

VIA FACSIMILE AND ECF
Honorable Kimba M. Wood
United States District Judge
Southern District of New York
500 Pearl Street
New York, New York 10007

RE: *United States v. Ianniello et al*
05 Cr. 774 (KMW)

Inaudibility of the Eight (8) Compact Disks
Containing Conversations from Don Pepe
Restaurant as Reported by Thomas Carroll [most
often the government's chief audibility specialist]

Dear Judge Wood:

In connection with an evaluation as to their audibility and enhanceability, the government provided to Carroll Audio Services, eight (8) Compact Disks (CDs) representing the conversations at Don Pepe Restaurant. It is believed that the government's set of CDs, which was digitally recorded directly onto a computer hard drive and then downloaded to the CDs, as well as the set provided to Carroll Audio which was recorded in the same manner, represent the most audible record of the Don Pepe Restaurant meetings and conversations [the government's set is as audible/inaudible as the ones examined by Mr. Carroll]. The government furnished to the defendants CDs that we believe are less audible than the government's and the ones inspected by Mr. Carroll.

Mr. Carroll's report, accompanying this letter, with pertinent language circled, must of course be read, but in less technical language we summarize his findings:

1. Mr. Carroll recites, on a scale of "1" to "10", in terms of audibility, with 10 being totally unintelligible, these recordings are rated an "8" (i.e., nearly

completely inaudible) and, as will be noted below, are not complete records of the conversations;

2. the 8k bits per second storage rate (“bps”) (i.e., the rate at which the material was digitally recorded onto the computer hard drives and CDs) while allowing for a great deal of material to be stored, in fact reduced the audible quality of the recordings. Of critical importance, when the recordings were stored at this lower bit rate, certain frequencies of the audio intercepted were not archived and certain voice content was lost (that is, depending on the frequency – the number of complete vibrations or oscillations that a body undergoes – words or conversations were distorted due to the fact that certain sounds were not recorded). In short, Mr. Carroll’s report is to the effect that there is no assurance that the CDs contain a full record of conversations at Don Peppe Restaurant;

as to the question of “enhancement,” given that certain content of the vocal range is missing from these recordings, it was discarded by the archiving sample rate (8k bps) which did not allow for the recording of “th”; “f”; “s”; and “h” sounds, these sounds were lost and cannot be retrieved;

3. contrary to defendants’ original belief that the eight (8) Don Peppe CDs turned over to the defense, which state on the label that each represent 80 minutes of conversations for a total of 10 ½ hours of recordings, in fact contain approximately 120 hours of recordings;
4. the approximation of 120 hours, as noted above, while not containing a complete record of the conversations because certain sounds were not recorded, does not account for the listening time of what remains which due to the “poor to very difficult to understand” (p. 3) quality of the recordings, will take as much as ten to twenty times longer than the 120 hours. Additionally, were defendants to attempt to prepare transcripts, this preparation would obviously significantly increase the time needed to listen to these recordings (i.e., multiple playbacks would be required) (*id.*); and, finally,
5. due to the poor quality and sheer volume of the material, any enhancement, if possible, will at the very best be measured in terms of months with a judgment to be made as to what is pertinent (but how is this possible not knowing what is missing).

* * *

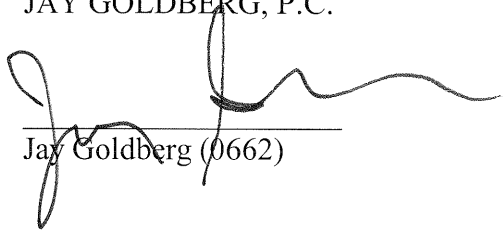
Whether it be the doctrine of completeness required under Fed. R. Evid. 106, or the use of a balancing test under Fed. R. Evid. 403, and given the considered

choice by the agents to store these conversations at an 8k bps storage rate which was inappropriate for the task, the body of conversations on the eight CDs should as a whole be excluded. *See e.g. United States v. Arango-Correa*, 851 F.2d 54 (2d Cir. 1988) (unintelligible portions of tape may be so substantial as to render the recording as a whole unworthy).

Respectfully,

JAY GOLDBERG, P.C.

By:


Jay Goldberg (0662)

JG:faf
Encl.

cc: Stephen Miller, Assistant United States Attorney
Defense Counsel

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December 27, 2005

Reference : Ianello et al: Audio Disks

Comments on presented audio files stored as digital information in archive format.

A series of recordings was presented to Carroll Audio Services for review.

The recordings are contained on Compact Disks (CD), as computer data files. These disks are referred to hereafter as CD-D (CD-"Data"), and are to be differentiated from CD-A (CD-"Audio").

[- A CD-A disk is commonly played in a portable music device or a car audio player. The format for the CD-A disks allows a storage of material ranging from 60 to 90 minutes and is dependant on the capabilities of the playback device. A common practice is to limit the content on these disks to less than 80 minutes and for general distribution and for the greatest compatibility with playback devices, a maximum of 60 minutes is considered good practice. -]

[- A CD-D disk contains data to be interpreted by a computer. The file content may be pictures, sounds, text or other material, but it is all data to be "handled" by the computer programs. These disks do not play in a car audio system and in most instances on portable audio devices. (Recently portable audio devices have been manufactured and sold that are special units that can handle the ("MP3") audio file format. This is not universal, so few devices can handle this material) -]

The content on the CD-D disk: presented is in an archive format. The material is presented as a "web page" and by clicking on a desired recording the material requested is opened for listening. The web page format indicates a start time but does not indicate an end time or duration of the recordings. A file storage size is indicated.

The content in the archive is compressed to maximize the quantity of material rather than the quality of the material. The digital data is sampled at 8000 bits per second (8K) in this archive. The material is monaural.

[– An audio CD-A is sampled at 44100 (44.1K) and is stereo. A Data CD using the archive format utilized in this archive could hold information equivalent to ($5*8K=40K$) and mono not stereo ($= *2$) so a number of 60 minute audio CD's could be reproduced in this archive. A quick estimation gives the capability of 10 hours per disk. -]

In practice, the first disk examined had some files that had little actual content. Clicking on a file brought forth a one second or less listening experience. Other files had greater duration but no discernable content. The archive format utilized stores all the individual files in an individual file folder. This storage hierarchy prevents the viewing the size of the content of the folders utilizing normal Windows Operating System utilities. Each individual folder must be opened and then the individual file can be viewed as to it's file size. The file size can then be interpolated to a time.

In the examination of disk one, we utilized advanced disk utilities to deconstruct the archive storage system and allow perusal of the material by file size.

On the Disk 'Sessions 1 - 150" the larger files found were:

17;18;19;20;28;30; and 46.

ITEM	SIZE in bytes	Duration in Minutes:Seconds
17	14,833,770	30:53
18	11,695,235	24:21
19	25,671,322	53:28
20	10,252,650	21:21
28	23,817,780	49:36
30	10,007,592	20:59
46	13,496,392	39:02

(The Duration figure was determined by opening the file and allowing the Windows Media Player to determine the playing time.)

These 7 files of the 150 indicted on the disk are 3:59:40 or approximately 4 hours of listening material. The archive indicates the disk contains 380,166,144 Bytes.

The files above contain bytes of about 110,000,000. Since this is effectively 1/3 of the disk content it is fitting to project the disk has content in excess of 12 hours of material to review.

This storage figure 110,000,000 can be restated as 110 M (Megabytes). It would give us a rough estimator of:

$(1/3 = 4 \text{ hours then } 3/3 = 12 \text{ Hours in } 110\text{M}.$

The Optical Authoring Manager CD Index utilized for this archive project reports the discs provided with this information:

(I have added the call numbers for clarity as a few of the Disks are Disk One.)

Disc 1 -	VOL000067	380,166,144 bytes,	150 files	00001 - 00150.
Disc 1 -	VOL000069	351,297,536 bytes	150 files	00150 - 00300
Disc 1 -	VOL000070	604,780,544 bytes	335 files	00301 - 00635
Disc 1 -	DON-PEP_3	453,302,272 bytes	300 files	00001 - 00300
Disc 1 -	DON_PEP_4	384,077,824 bytes	300 files	00301 - 00600
Disc 1 -	DON_PEP_5	365,123,584 bytes	300 files	00601 - 00900
Disc 1 -	DON_PEP_6	502,022,144 bytes	300 files	00901 - 01200
Disc 1 -	VOL000065	349,915,136 bytes	292 files	01200 - 01492

The Megabyte total for the material is about 3400M. (3.4G) (Gigabytes) From the files opened and time reported by Windows Media Player for Disc One content, this 3400M of files divided by 1.1M per 4 hours will equal:

$3400\text{M} / 1.1\text{K} = 30 \text{ units of } 4 \text{ hours or } 120 \text{ hours of content approximate.}$

A spot check of files contained on the CDs revealed none that had a different sampling rate.

120 hours of content total for the 8 CDs is a fair and accurate estimation of content. A more precise estimation would require accounting for each byte but a quick proof is to take file:

#30 from Disk One with a size of 10,007,592 and a reported play time of 20:59.

Rounding to 10M = 1/3 hour then:

The Rounded Sum of Megabytes reported for all Discs, $3,390 / 10 = 339$

$339 / 3 = 113 \text{ hours.}$

The estimation methods utilized allow a reasonable and speedy method of estimating the length of content. In this case it is fair to report that the run time for the entire CD archive of 8 discs will be approximately 113 to 125 hours. Interpolating the results and allowing for rounding errors, I feel 120 hours is the run time figure to use. This figure does not account for the handling and review time required for court purposes. As much of the material we encountered in this examination was poor to very difficult to understand, the actual review time to listen to some sections ten or twenty times as for transcript preparation would be quite additive to the hours represented.

Quality and Potential for Enhancement:

The archive format presented here is storing the recordings at 8000 bits per second storage. This allows a great deal of material to be stored, but lessens the audible quality of the material. Just resampling the material to a greater rate, (CD quality at 44.1K) will not improve the audibility of the content. When audio material is stored at a low bit rate, certain frequencies of the audio content intercepted are not archived. This material is lost.

The normal practice in digital audio recording is to sample (the bit rate) at twice the frequency of the highest frequency to be encountered. The CD quality we all encounter can accommodate frequencies beyond the range of human hearing comfortably. (Human hearing range for most audio work is considered 15000 cycles per second. (CPS).) The CD sampling rate is 44.1

This archive uses a sampling rate of 8K, indicating and necessitating a top frequency capture of 4000 cycles per second. For clarity in speech, under optimum conditions this is adequate for recordings of telephone calls, dictation, and other low quality applications. It is not an adequate rate to archive or record speech as this that is captured with high levels of surrounding noise or other ambience.

The choice of the 8 K sampling rate is in effect to make the reviewer of the material partially deaf, by choosing to discard some of the consonant sounds that allow us to readily recognize words. The "th"; "f"; "s" and "h" sounds fall in the frequency range above what is sampled in this archive. They are greatly diminished in this recording, and their absence makes our ability to understand the content a very difficult chore. It does however make our ability to misinterpret the content much more likely. We do tend to "interpret" what we hear, to make sense of the content when we do not hear speech clearly.

The material I spot checked is a recording of speech under adverse conditions. The speakers recorded are not engaging the microphone, the other parties in the room are not silent, and the general hubbub of the venue and location of the microphone all are detrimental to a quality recording. When combined with the archiving sample rate, this material must be considered as very poor, and if given on a scale of "1 to 10", with "1" as ideal and "10" as totally unintelligible I feel "8" is a fair rating for the material I spot checked. I did not review all potential 120 hours encompassed by this archive. I spot checked files throughout the archive to make this determination. I listened to less than ½ hour of content in a non-continuous and piecemeal fashion.

Enhancement:

Certain content of the vocal range is missing from these recordings. It was discarded by the archiving sample rate, and it cannot be recovered from the recording. It is not there. I can process the material to attempt to improve the intelligibility, relying on the frequencies remaining. In some instances this will be beneficial to the ability of a listener to accurately hear the material. In some instances there will be no improvement. A decision has to be made during the application of enhancement techniques as to the efficacy of a particular technique and if it has had a detrimental effect on the content. If a detrimental effect is noted, then that technique is modified or not utilized. Some recordings can benefit from the application of techniques in stages. Other recordings are just best left alone. This can only be determined during the application of enhancement techniques.

Since the archive represents many different recordings, hence recording situations and background content, these recordings must be treated on an individual basis. Since the time involved in working enhancement on 120 hours of recordings of a very difficult nature is measured in months, any effort made to improve content in this archive must be focused to pertinent material.

Thomas D. Carroll

A handwritten signature in cursive script that reads "Thomas D. Carroll". The signature is fluid and matches the printed name above it.